



Tropentag, September 18-21, 2016, Vienna, Austria

“Solidarity in a competing world —  
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## Cost Benefit Analysis of Seed Potato Replacement Strategies among Smallholder Farmers in Kenya

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### Abstract

Potato yields of smallholder farmers in Kenya fall at 8 t ha<sup>-1</sup> way below attainable yields of 35 – 40 t ha<sup>-1</sup>, this is mostly due to a potent combination of inadequate supply of quality seed and limited awareness of better seed crop management practices. Most seed is informal, very often contaminated with seed borne diseases like Bacterial wilt caused by *Ralstonia solanacearum* and viruses in particular PVY and PLRV causing severe seed degeneration leading to yield and economic losses. The presented study aimed at providing smallholder potato farmers with information on how to increase their profit margin by choosing the best seed replacement strategy. In this respect a seed replacement strategy trial was set up at different on-farm sites in three counties (Kiambu, Nyandarua and Nakuru) in Kenya. The study employed a participatory approach at each site with an average of 15 farmers. The seed replacement strategies tested included: certified seed (CF), positive selected seed (PS), randomly selected farmers seed (RSFS), seed derived from bulking of small quantities of CF in small seed plot (SSPT) (5% of the area demand bought in previous season for bulking) added with PS seed (5%SSPT+PS), or with RSFS (5% SSPT+RSFS), 20% CF seed combined with PS seed and RSFS respectively. Results showed significant difference in profit between the strategies used. Profit margins increased by 1200–3000 US\$ compared to farmers seed qualities, however due to high investment cost for CF seed, profit margins of all integrated strategies with smaller CF seed influx quantities and PS were higher hence more likely to be adopted. Furthermore, to reach similar profit margins than with farm saved seed, farmers have to at least double their yields when using CF seed compared to only between 5% (PS) to 22% (20% CF +PS) when using integrated seed quality improvement strategies. Best option in terms of profits at little risks of losing the investment have been the combination of SSPT and PS. The study recommends to promote integrated seed quality improvement strategies combining regular influx of small quantities of high quality seed with on-farm seed quality improvement methods adapted to smallholder farmers realities.

**Keywords:** Seed quality, seed-borne diseases, smallholder farmers